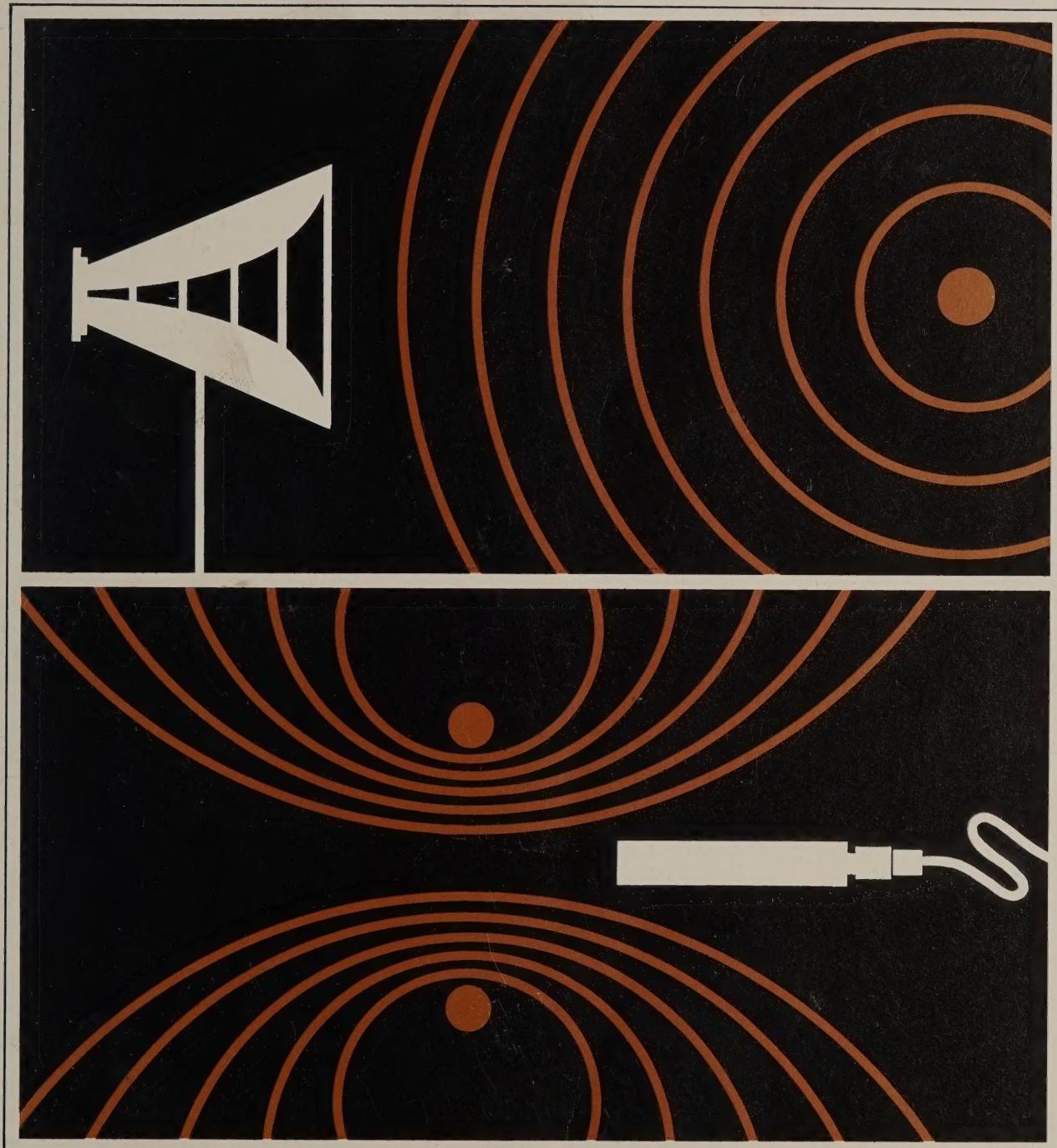


# EMCO

## EMI/MAGNETICS INSTRUMENTATION



The Electro-Mechanics Company

# EMCO

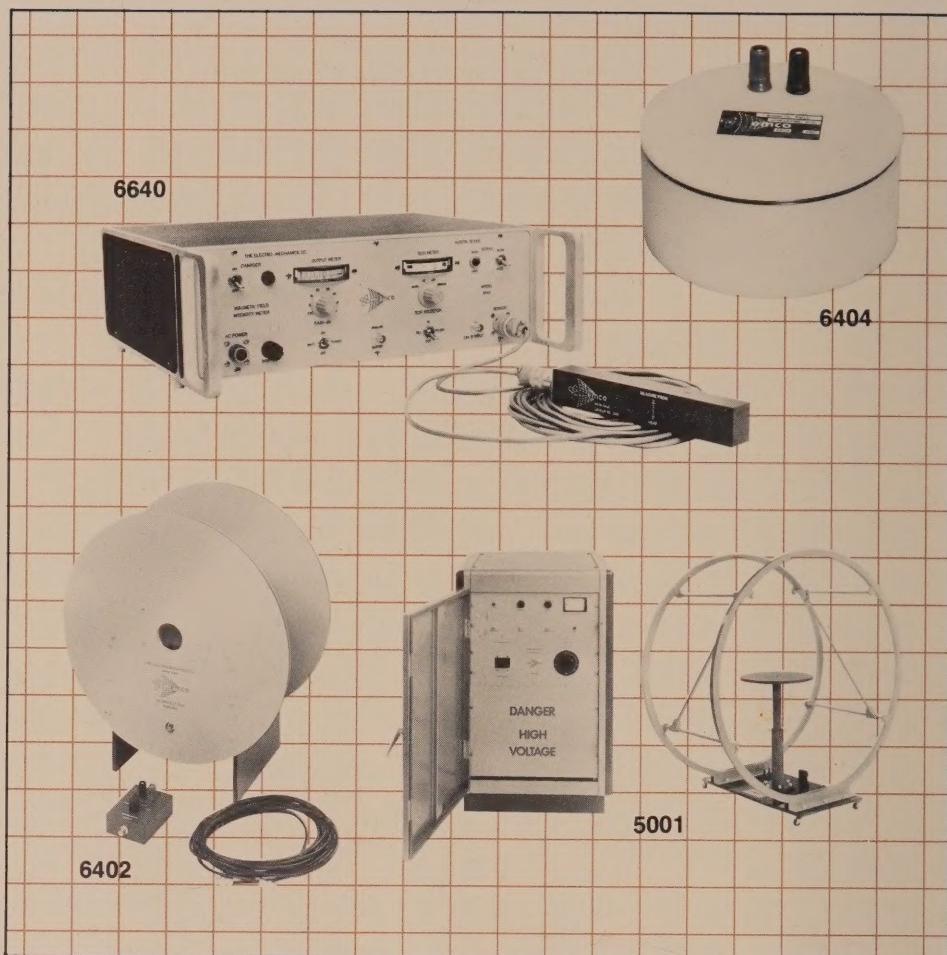
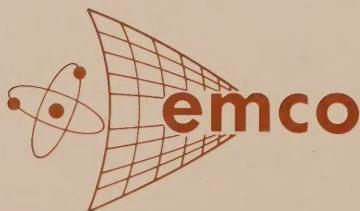
## Introduction

The Electro-Mechanics Company was formed in 1951 to help industrial companies, research firms and government agencies find solutions to difficult RFI/EMI problems. The growth of EMCO, as an instrument supplier and problem-solver to these industries, is surpassed only by its growth in unique capabilities and product development.

EMCO has developed the capabilities to help solve electromagnetic compatibility problems in defense, electronics, transportation and many other fields. By continuing to offer assistance with the top engineering and manufacturing staff in the EMI field for customer "specials," EMCO has developed one of the broadest choices of RFI/EMI equipment available.

The products and services offered by EMCO can be categorized under these fields of interest . . . magnetics, antennas and rejection networks. Although the two latter fields continue to grow with new developments, interest in the magnetics field is rapidly increasing because of its close relationship with current RFI/EMI testing procedures.

This brochure is designed to give you a general overview of capabilities and products offered by The Electro-Mechanics Company. Technical information on each instrument is available on individual product brochures. If you need more information contact your EMCO representative or EMCO in Austin, Texas.



## MAGNETICS

Beginning with the Variable-Mu magnetometer, in practical use since 1956, EMCO has been at the forefront of development for magnetics EMI test instrumentation. EMCO's line of magnetics test equipment provides researchers, engineers and designers with vital portions of information needed for accurate RFI/EMI testing and electronics security studies.

### Model 6640 Magnetic Field Intensity Meter

A broadband, low-frequency receiver whose response is proportional to the amplitude of the magnetic field variations present at its directional sensor. Designed to help researchers and designers solve low-frequency induction field problems and problems caused by the effects of existing or man-made induction fields.

Proven applications include RFI/EMI testing, environmental measurements and narrowband/broadband measurements.

### Models 6402 and 6403 Helmholtz Coil Systems

Designed specifically for calibration of the Model 6640, these systems allow the 6640 to be directly calibrated at any frequency between DC and 50 KHz. This system can be used for any application requiring a known homogeneous magnetic field.

### Model 5001 Magnetic Susceptibility Testing System

The MSTS is the first system designed specifically for quantitative magnetic susceptibility measurements. The control console and the fiber glass/linen phenolic Helmholtz coil and pedestal allow for accurate test exposures of the electronics equipment being tested.

### Model 6404 Magnetic Field Generating Coil

A device to facilitate magnetic susceptibility tests in accordance with MIL-STD-461A, test method RS01. Used in susceptibility testing of electronic equipment.

## LOG-PERIODIC ANTENNAS SERIES 3140



### SPECIFICATIONS

	Model 3145	Model 3146
Frequency range	100-1100 MHz	200-1000 MHz
Maximum length	59" (150 cm)	29½" (75 cm)
Maximum width	59" (150 cm)	29½" (75 cm)
Depth	2.5" (6.35 cm)	2.5" (6.35 cm)
Weight	7.5 lbs (3.4 kg)	4.5 lbs (2.0 kg)
Nominal impedance	50 ohms	50 ohms
Average VSWR	<2:1	<2:1
Connector	Type N	Type N
Average voltage Gain	9 dB	7 dB

### GENERAL DESCRIPTION

EMCO's new Models 3145 and 3146 Log-Periodic antennas were designed for specific frequency coverages applicable in EMC testing. They are lightweight and compact enough for useful applications such as anechoic chambers and shielded enclosures, where space is a vital consideration.

These antennas are fully calibrated to include gain and antenna factors making them ideal for compliance testing for FCC Part 15. When used for susceptibility testing, they can handle up to 1000 Watts of input power, creating fields of over 200 volts per meter.

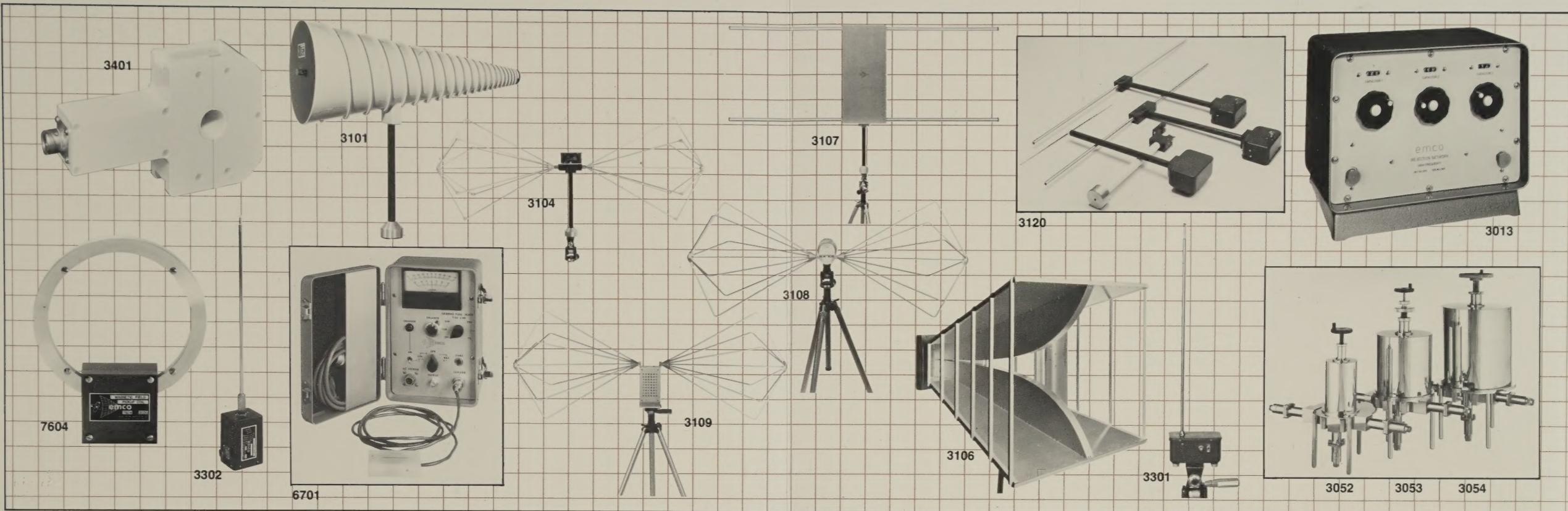
All antennas have a gain greater than 5 dB and are linearly polarized. They also have the relatively constant input impedance characteristic of log-periodics. The 3145 has a frequency range of 100-1100 MHz with a maximum width of 1.5 meters (59"). The Model 3146 covers the frequency range of 200-1000 MHz and has a maximum width of 75cm (29½").

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#### **Model 7604 Magnetic Pickup Coil**

An instrument for measuring magnetic emissions in accordance with MIL-STD-461A, method RE01. Normally used with a suitable Field Intensity Meter in the range of 30 Hz to 30 KHz.

#### **Model 3302 Electrical Field Probe**

The 3302 probe enables the 6640 to be used as an electrical field measuring instrument in the frequency range of 100 Hz to 50 KHz. Completely interchangeable with the 6640 probe, the 3302 works off the battery supply in the model 6640.

#### **Model 3401 Current Probe**

The 3401 enables the 6640 to be used as a low level current measuring device operating in the frequency range of 0.1 Hz to 50 KHz. Because the 3401 does not depend on a transformer type action for current measurement it is an excellent device to be used where trans-

former types may cause undesirable effects. This probe makes the 6640 exceptionally suited for conducted interference measurements.

#### **Model 6701 DC Magnetometer**

A lightweight, battery-powered instrument for providing magnetic field strength information. Applications include: detection of geomagnetic activity, magnetic surveys, quantitative measurement of field intensity, shielding effectiveness of magnetic shield enclosures, traffic counting and control, weapons detection (security check), aspect sensor.

#### **ANTENNAS**

##### **Models 3101, 3102, and 3103 Conical Log-Spiral Antennas**

These antennas receive broadband signals in the 100 MHz-10 GHz frequency range. Particularly suited for use in creating the field strengths required in the susceptibility measurement portions of EMI specifications, these antennas

are useful in a screen room where space is limited and where proximity effects must be minimized.

#### **Model 3104 Biconical Antenna**

Designed to operate over the 20 MHz to 200 MHz frequency range for measurements to meet military and DoD EMI specifications, the 3104 is ideally suited for radiation emission and susceptibility specification testing. The size of the 3104 makes it useful for enclosure shielding effectiveness measurements.

#### **Model 3108 High Power Biconical Antenna**

Operating in the 30 MHz to 300 MHz frequency range, the 3108 has the ability to handle large power levels. Designed to meet DoD and military EMI specifications, the 3108 is excellent for use in radiated susceptibility as well as radiated emission testing.

#### **Model 3109 High Field Biconical Antenna**

The 3109 operates over the frequency range of 20 MHz to 300 MHz for generating high intensity fields in EMC susceptibility testing. This antenna is specifically designed for irradiated susceptibility testing for materials and equipment which must be subjected to high intensity electromagnetic fields.

#### **Model 3105, 3106 and 3103 Double Ridged Guide Antennas**

Built to receive and radiate EMI/RFI signals in the 1 GHz-12.4 GHz (3105); 200 MHz-2000 MHz (3106) and 1 GHz-18 GHz (3115) frequency ranges, these antennas are used for EMI measurements and specification compliance testing. These linearly polarized broadband antennas exhibit highly efficient performance characteristics.

#### **Model 3107 Parallel Element Antenna**

A broadband antenna designed to generate large electric fields, the 3107 has an excellent

wideband design which permits operation over the entire 10 KHz to 30 MHz frequency range in two bands. The 3107 is used for susceptibility testing in accordance with military and DoD specifications.

#### **Model 3120 Adjustable Element Dipole Antennas**

Using a 50 ohm input impedance field intensity meter, the 3120 system will operate over the frequency range of 28 MHz to 1 GHz. The 3120 is designed with measurement capabilities to meet military and FCC radiation emissions compliance testing standards.

#### **Model 3301 Electric Field Antenna**

The 3301 is an active rod antenna with a broadband low noise amplifier operating in the 14 KHz to 30 MHz frequency range. With its self-contained battery supply, the 3301 is capable of driving any receiver with 50 ohm input impedance.

#### **REJECTION NETWORKS**

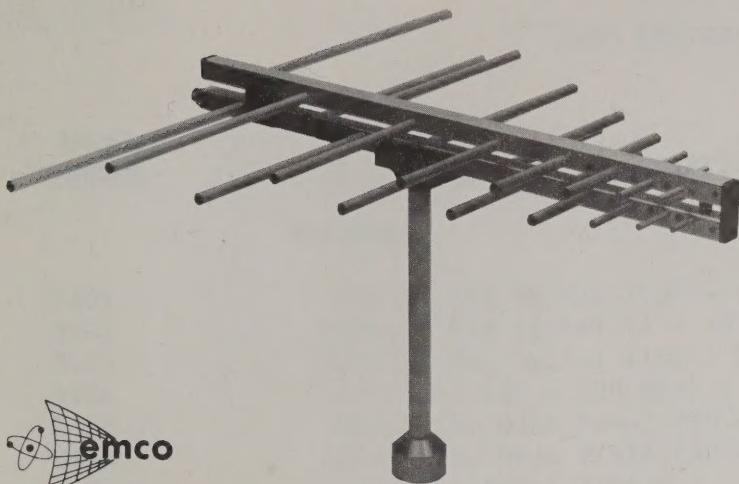
##### **Model 3011-3013 and 3021-3023 Bridged-T Rejection Networks**

These rejection networks are passive, continuously tunable notch filters providing as much as 100 db of attenuation over the frequency range of 10 KHz to 1 GHz. Designed specifically for radio frequency interference testing according to various military specifications, these rejection networks are made of light, rugged components.

##### **Model 3051, 3052, 3053 and 3054 Cavity Rejection Networks**

Designed for specification compliance testing, the cavity rejection networks are continuously tunable rejection filters operating in the frequency range 1.0 GHz to 10 GHz. The cavities are constructed of brass and aluminum, the networks exhibit extremely sharp resonances at the tuned frequency.

## LOG-PERIODIC ANTENNAS SERIES 3140



### SPECIFICATIONS

	Model 3145	Model 3146
Frequency range	100-1100 MHz	200-1000 MHz
Maximum length	59" (150 cm)	29½" (75 cm)
Maximum width	59" (150 cm)	29½" (75 cm)
Depth	2.5" (6.35 cm)	2.5" (6.35 cm)
Weight	7.5 lbs (3.4 kg)	4.5 lbs (2.0 kg)
Nominal impedance	50 ohms	50 ohms
Average VSWR	<2:1	<2:1
Connector	Type N	Type N
Average voltage gain	9 dB	7 dB

### GENERAL DESCRIPTION

EMCO's new Models 3145 and 3146 Log-Periodic antennas were designed for specific frequency coverages applicable in EMC testing. They are lightweight and compact enough for useful applications such as anechoic chambers and shielded enclosures, where space is a vital consideration.

These antennas are fully calibrated to include gain and antenna factors making them ideal for compliance testing for FCC Part 15. When used for susceptibility testing, they can handle up to 1000 Watts of input power, creating fields of over 200 volts per meter.

All antennas have a gain greater than 5 dB and are linearly polarized. They also have the relatively constant input impedance characteristic of log-periodics. The 3145 has a frequency range of 100-1100 MHz with a maximum width of 1.5 meters (59"). The Model 3146 covers the frequency range of 200-1000 MHz and has a maximum width of 75cm (29½").

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## PRICE and DELIVERY SCHEDULE

## EMCO EMI/RFI PRODUCTS

<u>MODEL NUMBER</u>	<u>DESCRIPTION</u>	<u>PRICE</u>	<u>SHIPMENT ARO</u>
<b>Antennas</b>			
3101	Conical Log Spiral (200 - 1000 MHz)	\$ 845.00	Stock - 45 Days
3102	Conical Log Spiral (1 - 10 GHz)	775.00	Stock - 45 Days
3103	Conical Log Spiral (100 - 1000 MHz)	1,215.00	Stock - 45 Days
3104	Biconical (20 - 200 MHz)	855.00	Stock - 45 Days
3108	Biconical, High Power (30 - 300 MHz) (300 W)	1,255.00	Stock - 45 Days
3109	Biconical, High Field (20 - 300 MHz) (1 KW)	1,420.00	Stock - 45 Days
3104-B	Balun for Model 3104	550.00	Stock - 45 Days
3108-B	Balun for Model 3108	850.00	Stock - 45 Days
3109-B	Balun for Model 3109	1,050.00	Stock - 45 Days
3105	Double Ridged Guide (1 - 12.4 GHz)	1,725.00	Stock - 45 Days
3106	Double Ridged Guide (200 - 2000 MHz)	3,050.00	Stock - 45 Days
3115	Double Ridged Guide (1 - 18 GHz)	1,885.00	Stock - 45 Days
3107	Parallel Element (10 KHz - 30 MHz)	1,545.00	Stock - 45 Days
3301	Active Antenna - Electric Field (10 KHz - 30 MHz)	995.00	Stock - 45 Days
3120	Complete Adjustable Element Dipole Set, including Balun B-1, B-2, B-3, with mounting mast, clamp and carrying case	2,150.00	Stock - 45 Days
3120 B-1	Balun for 28 - 140 MHz	795.00	Stock - 45 Days
3120 B-2	Balun for 140 - 400 MHz	765.00	Stock - 45 Days
3120 B-3	Balun for 400 - 1000 MHz	715.00	Stock - 45 Days
3145	Log Periodic (100 - 1100 MHz)	1,100.00	Stock - 45 Days
3146	Log Periodic (200 - 1000 MHz)	1,000.00	Stock - 45 Days

## Line Impedance Stabilization Networks

3705	450 KHz- 30 MHz model to meet FCC Spec, 5 Amp model, available in multiple phase units	285.00 per phase	Stock - 45 Days
3720	450 KHz - 30 MHz model to meet FCC Spec, 20 Amp model, available in multiple phase units	325.00 per phase	Stock - 45 Days
3805	10 KHz - 30 MHz model to meet European spec, 5 Amp model, available in multiple phase units	550.00 per phase	Stock - 45 Days
3820	10 KHz - 30 MHz model to meet European spec, 20 Amp model, available in multiple phase units	600.00 per phase	Stock - 45 Days

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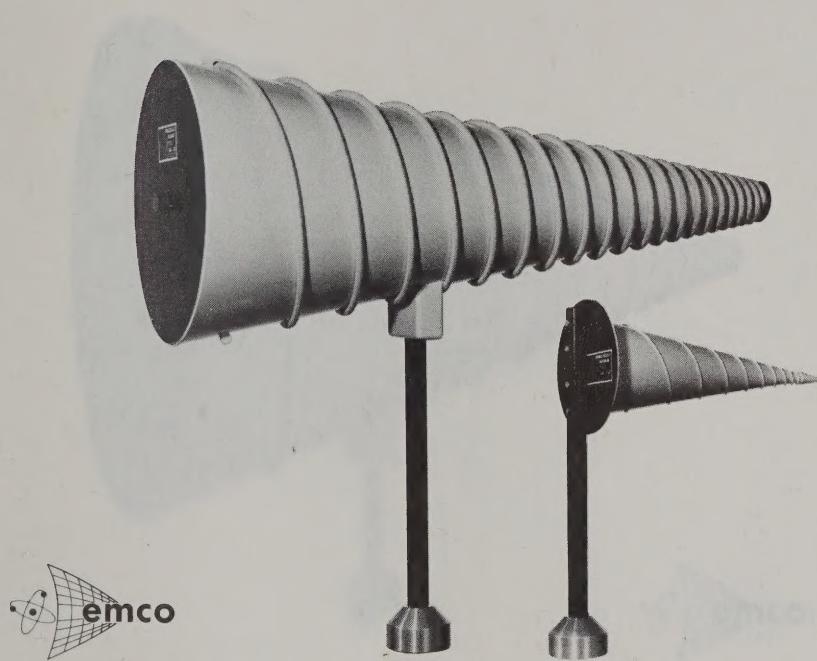
<u>MODEL NUMBER</u>	<u>DESCRIPTION</u>	<u>PRICE</u>	<u>SHIPMENT ARO</u>
<b>Rejection Network, Bridged-T</b>			
3011	LF Table Mount (10 KHz - 100 MHz)	\$ 5,550.00	90 Days
3012	MF Table Mount (100 MHz - 400 MHz)	5,250.00	90 Days
3013	HF Table Mount (400 MHz - 1000 MHz)	5,250.00	90 Days
	Rack Mount available for \$300.00 additional per unit.		
3011-3013	Set of 3 units	15,250.00	90 Days
<b>Rejection Network, Cavity</b>			
3051	15 inch diameter (1.0 - 2.2 GHz)	6,525.00	90 Days
3052	8 inch diameter (2.2 - 3.1 GHz)	6,050.00	90 Days
3053	6 inch diameter (3.0 - 6.5 GHz)	5,950.00	90 Days
3054	3 inch diameter (6.5 - 10.0 GHz)	5,950.00	90 Days
3051-3054	Set of 4 units	22,900.00	90 Days
<b>Field Generating Coils</b>			
6404	Magnetic Field Generating Coil (RS01)	295.00	Stock - 14 Days
7604	Magnetic Field Pickup Coil (RE01)	455.00	Stock - 45 Days
<b>Magnetics</b>			
6402	Helmholtz Coil System, 18-inch Diameter	1,195.00	Stock - 45 Days
6403	Helmholtz Coil System, 24-inch Diameter	1,395.00	Stock - 45 Days
6406	Helmholtz Coil System, 6-ft Diameter	8,695.00	60-90 Days
6640	Magnetic Field Intensity Meter	9,850.00	60-90 Days
3202	Sensor, High Intensity Magnetic Field	1,395.00	60-90 Days
3302	Probe, Electri Field	1,605.00	60-90 Days
3401	Probe, Current	1,605.00	60-90 Days
6701	Magnetometer, DC	2,025.00	60-90 Days
6142	Magnetomer, Variable-Mu	9,950.00	60-90 Days
<b>Accessories</b>			
TR-1	Tripod (Standard) - Non-magnetic	135.00	Stock - 45 Days
TR-2	Tripod (Heavy Duty) - Non-magnetic	325.00	Stock - 45 Days
TRCC-1	Tripod Carrying Case	35.00	Stock - 45 Days
	Extra Instruction Manuals	35.00	

One Instruction Manual Shipped N/C with each instrument

FOB Austin, Texas

Effective Date: July 1, 1981  
 Prices Subject to Change without notice

## CONICAL LOG-SPIRAL ANTENNAS MODELS 3101 & 3102



### GENERAL DESCRIPTION

EMCO Log-Spiral Antennas receive broadband signals in the 200 MHz-10 GHz frequency range for measurements to meet EMI specifications such as MIL-STD-826A and MIL-STD-462.

Two models of the EMCO Log-Spiral Antennas are available. Both Models 3101 and 3102 are particularly advantageous for use in a screen room where space is limited and where proximity effects must be minimized.

The spiral winding is made on a fiberglass cone which is attached to a phenolic rod equipped with a metal base. An antenna or camera tripod accepts the mounting base.

Models 3101 and 3102 are precisely manufactured in accordance with Air Force drawings 62J4040 and 62J4041, respectively.

### SPECIFICATIONS

Model Number	3101	3102
Frequency Range	200-1000 MHz	1-10 GHz
Average Power Gain	2.75 dB	3.75 dB
Average VSWR	<2.5	<2.0
Axial Ratio	<1 dB	<1 dB
Average Beamwidth	80°	50°
Impedance	Nominal 50 ohms	Nominal 50 ohms
Polarization	Circular	Circular
Dimensions:		
Length	32"	15"
Diameter (max.)	13"	5"
Weight	17 1b	8 1b

Specifications subject to change without notice.

Calibration tables and polar patterns are furnished with each antenna.

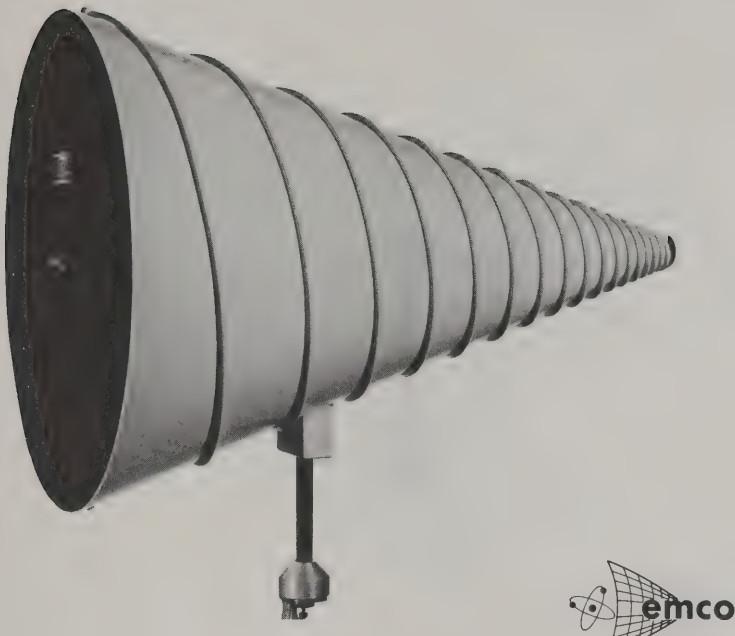
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## CONICAL LOG-SPIRAL ANTENNA MODEL 3103



### GENERAL DESCRIPTION

The EMCO Model 3103 Log-Spiral Antenna is designed for operation in the frequency range of 100 MHz-1 GHz. The antenna is particularly suited for use in creating the field strengths required in the susceptibility measurement portions of EMI specifications such as MIL-STD-826A and MIL-STD-462. Less than 10 watts is required for creation of 10 V/M field strengths at a distance of 1.0 meter.

The antenna consists of a coaxial spiral winding attached to a fiberglass cone. An adaptor is provided for tripod mounting.

### SPECIFICATIONS

Frequency Range	100 - 1000 MHz
Average Power Gain	2 dB at 1.0 meter
Average VSWR	< 2.5
Average Beamwidth	75°
Impedance	nominal 50 ohms
Polarization	circular
Dimensions	
Length	40 inches
Diameter	26 inches (max.)
Weight	27 lb

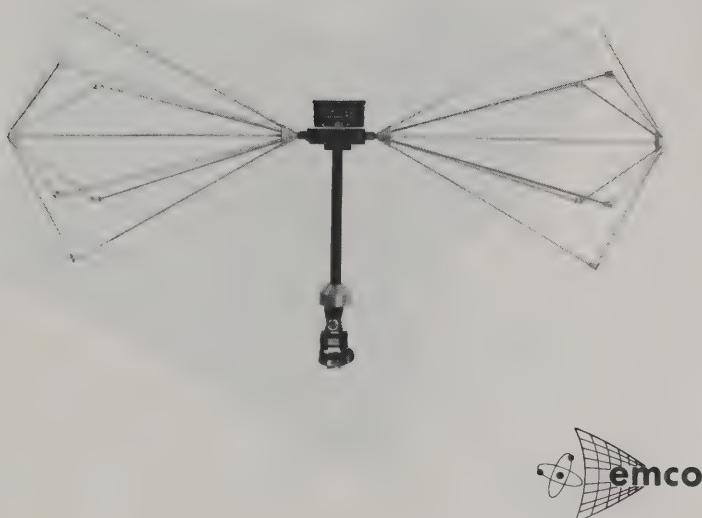
Specifications subject to change without notice.

Calibration tables and polar patterns are furnished with each antenna.

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## BICONICAL ANTENNA MODEL 3104



### GENERAL DESCRIPTION

The EMCO Model 3104 Biconical Antenna is designed to operate over the 20 MHz-200 MHz frequency range for measurements to meet Military and DoD EMI specifications. It is of lightweight construction for ease in portability and storage.

The Biconical elements are made from aluminum rods and are joined by tack welds. The elements mount in a balun network which is fabricated of phenolic and the necessary impedance-matching components.

The Model 3104 is precisely designed and manufactured in accordance with Drawing ES-F-201286 and MIL-STD-461.

### APPLICATIONS

The EMCO Model 3104 Biconical Antenna is particularly suited to radiated emission and susceptibility specification compliance testing such as is outlined in MIL-STD-826A and MIL-STD-462.

The broadband frequency capability of the Model 3104 eliminates the need for band switching, element extension, or external tuning when used for EM ambient surveys or spectrum signature measurements.

### SPECIFICATIONS

Frequency Range	20 - 200 MHz
Impedance	Matched to 50 ohms
Length	56.5 inches tip-to-tip
Diameter	21 inches maximum
Depth	32 inches including balun
Weight	6 lb

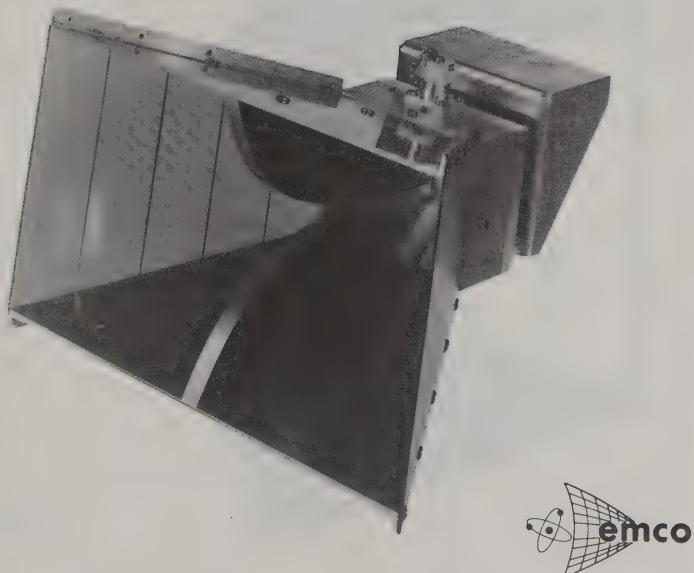
Specifications subject to change without notice.

Calibration tables are furnished with each antenna.

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## DOUBLE RIDGED GUIDE ANTENNA MODEL 3105



### GENERAL DESCRIPTION

The EMCO Model 3105 Double Ridged Guide Antenna is built to measure and radiate EMI/RFI signals in the 1 GHz to 12.4 GHz frequency range. Exhibiting highly efficient performance characteristics for a broadband antenna, the Model 3105 is ideal for measurements to meet present and proposed MIL-STD EMI specifications as well as for field generation in radiated susceptibility testing.

A primary advantage of the Model 3105 stemming from its small size is its suitability for use in the limited space of a screen room. Rugged aluminum construction makes the Model 3105 excellent for use under severe field conditions. A bracket is provided for standard tripod mounting in any polarization position.

### SPECIFICATIONS

Frequency Range	1 - 12.4 GHz
Average Power Gain	10.7 dB over isotropic
Average VSWR	<1.5
Average Beamwidth	E Plane 53°, H Plane 48°
Power for 200 V/M	250 watts
Impedance	Nominal 50 ohms
Connector	Type N
Dimensions	
Length	11" (includes tripod mount)
Width	9-5/8"
Height	6-1/4"
Weight	4 lb

Specifications subject to change without notice.

Calibration tables and polar patterns are furnished with each antenna.

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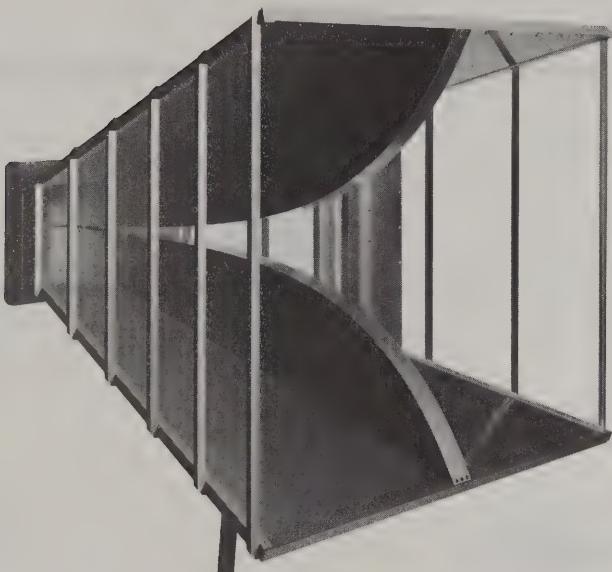
## DOUBLE RIDGED GUIDE ANTENNA MODEL 3106

### GENERAL DESCRIPTION

The EMCO Model 3106 Double Ridged Guide Antenna is a linearly polarized broadband antenna which has a useful frequency range of 200 MHz - 2000 MHz. The Model 3106, built in accordance with ECOM Drawings DL-ESA-217563, was designed specifically for EMI measurements and specification compliance testing. Relatively high gain and low VSWR over a wide frequency range characterize this antenna.

The antenna is precision machined from aluminum. The 50 ohm, type N connector is mounted on the base block of the antenna. A bracket is provided for tripod mounting. A heavy duty tripod is available at additional cost.

Each Model 3106 Double Ridged Guide Antenna is individually calibrated during the manufacturing process.



### SPECIFICATIONS

Frequency Range	200 MHz - 2000 MHz
Average Power Gain	7.8 dB over isotropic
Average VSWR	< 1.5
Impedance	50 ohms
Rated Power	500 watts
Average 3 dB Beamwidth	E Plane 50° H Plane 45°
Connector	Type N
Dimensions	
Width	38.5 inches
Height	28.7 inches
Depth	36.75 inches
Weight	26 lb

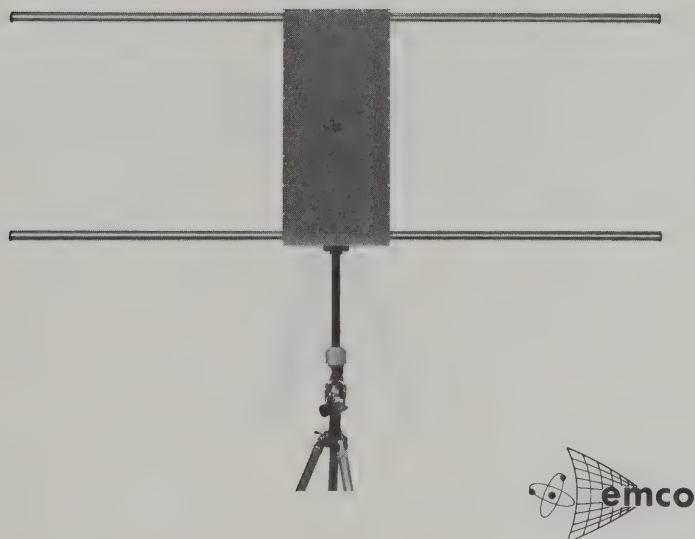
Specifications subject to change without notice.

Calibration tables and polar patterns are furnished with each antenna.

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# PARALLEL ELEMENT ANTENNA MODEL 3107



## GENERAL DESCRIPTION

The EMCO Model 3107 Antenna is a broadband, parallel element antenna designed to generate large electric fields over the frequency range 10 KHz - 30 MHz for susceptibility testing in accordance with Military and DoD Specifications. It is ideally suited for qualification susceptibility testing to MIL-STD-462 (RS03 and RS04) requirements. Excellent wideband design allows operation over the entire 10 KHz-30 MHz frequency range in two bands. The electric field intensity between the elements is approximately 200 volts/meter when the inputs are 67 volts for the 10 KHz to 1 MHz range and 45 volts for the 1 MHz to 30 MHz range.

The Model 3107 is constructed of lightweight materials for ease of handling. Clear plastic insulation on the antenna elements protects personnel from accidental burn or shock during operation at high intensity levels. The Model 3107 is supplied with a tripod mount. The elements are removable for ease of transportation and storage.

## SPECIFICATIONS

Frequency Range	10 KHz - 30 MHz
Input Impedance	100 ohms or greater
Field Pattern	At 1 meter on centerline, the field is a linearly polarized, essentially homogeneous E field.
E-Field Capability	Approx. 20 V/M at 1 meter on centerline with 67 volts input for the lowband and 45 volts input for the highband.
Connector	Type N
Assembled Dimensions	
Length	72.5 inches
Thickness	2 inches
Element Separation	24 inches
Weight	12 lb

Specifications subject to change without notice.

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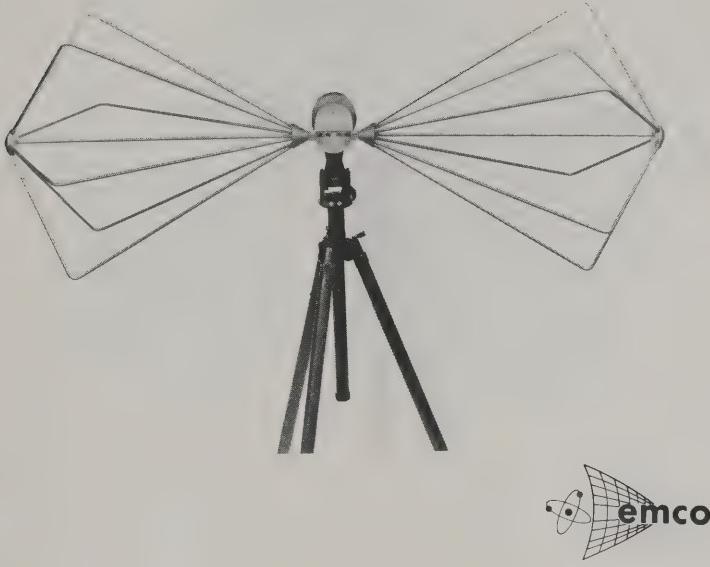
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## HIGH POWER BICONICAL ANTENNA MODEL 3108



### GENERAL DESCRIPTION

The EMCO Model 3108 High Power Biconical Antenna is designed to operate over the 30 - 300 MHz frequency range for measurements in accordance with present and proposed DoD and Military EMI Specifications. Its ability to handle large power levels over a broad frequency range makes the 3108 excellent for use in Radiated Susceptibility as well as Radiated Emission Testing.

The lightweight breakdown construction of the Model 3108 makes for ease of storage and portability. The biconical elements are made from welded aluminum rods. The 4:1 balun network is fabricated from silver-plated brass and aluminum and TFE thermoplastics.

The Model 3108 is manufactured in accordance with ECOM Drawings ES-DL-176433 and ES-F-201286.

### SPECIFICATIONS

Frequency Range	30 - 300 MHz
Impedance	Matched to 50 ohms
Connector	Type N
Power Input Capability	100 watts average
Average Balun VSWR	2.5:1 or less
Assembled Dimensions	
Length	51.75 inches
Diameter	20.5 inches
Weight	6 lb

Specifications subject to change without notice.

Calibration tables are furnished with each antenna.

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## HIGH FIELD BICONICAL ANTENNA MODEL 3109



### SPECIFICATIONS

Frequency Range	20 MHz - 300 MHz
Impedance	Matched to 50 ohms
Power Input Capability	1 KW average power
Average Balun VSWR	2.5:1 or less
Assembled Dimensions	
Length	52.5 inches
Diameter	20.5 inches
Weight	7 lbs.

Specifications subject to change without notice.

Calibration tables are furnished with each antenna.

### GENERAL DESCRIPTION

The EMCO Model 3109 High Field Biconical Antenna is designed to operate over the frequency range of 20 MHz - 300 MHz for generating high intensity fields required in EMC susceptibility testing. The high power handling ability of this antenna makes it capable of generating a 200 volt per meter field at one meter from the axis of the antenna over a wide frequency range.

The balun is compatible with the biconical elements of the EMCO Models 3104 and 3108 antennas, but it may be used with other elements for greater low frequency efficiency.

### APPLICATIONS

This antenna is specifically designed for radiated susceptibility testing of materials and equipment subjected to high intensity electro-magnetic fields.

The broadband frequency characteristics of the balun provide an optimum impedance match to the biconical elements over more than a decade of frequencies. The heavy duty construction of the bifilar wound balun helps prevent overload or breakdown under high power operation. The balun enclosure protects the user from accidental burns while allowing for cooling through natural convection.

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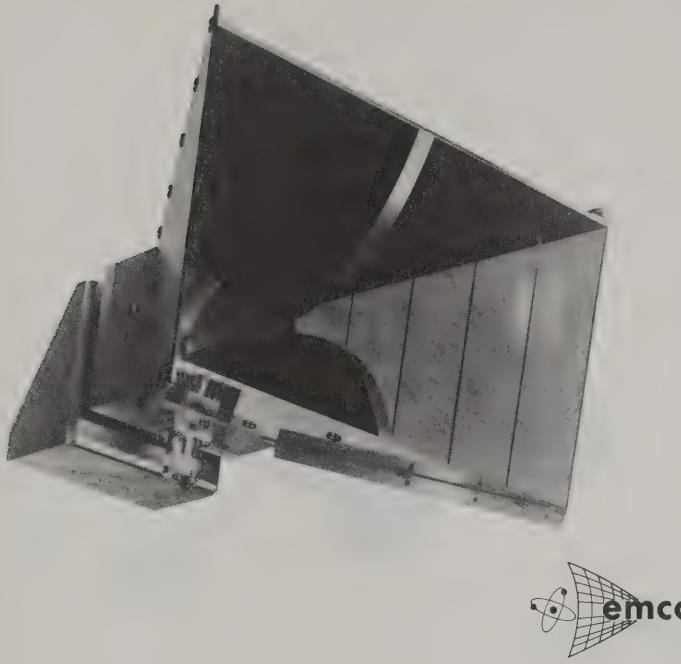
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## DOUBLE RIDGED GUIDE ANTENNA MODEL 3115



### GENERAL DESCRIPTION

The EMCO Model 3115 Double Ridged Guide Antenna is built to measure and radiate EMI/RFI signals in the 1 GHz to 18 GHz frequency range. Exhibiting highly efficient performance characteristics for a broadband antenna, the Model 3115 is ideal for measurements to meet present and proposed MIL-STD EMI specifications. It also is well suited for radiated susceptibility testing in the microwave band.

A primary advantage of the Model 3115 stemming from its small size is its suitability for use in the limited space of a shielded enclosure. Rugged aluminum construction makes the Model 3115 excellent for use under severe field conditions. A bracket is provided for standard tripod mounting in any polarization position.

### SPECIFICATIONS

Frequency Range	1 - 18 GHz
Average Power Gain	10.7 dB over isotropic
Average VSWR	< 1.5
Average Beamwidth	E Plane 53°, H Plane 48°
Power for 200 V/M	250 watts
Impedance	Nominal 50 ohms
Connector	Type N
Dimensions	
Length	11" (includes tripod mount)
Width	9-5/8"
Height	6-1/4"
Weight	4 lb

Specifications subject to change without notice.

Calibration tables and polar patterns are furnished with each antenna.

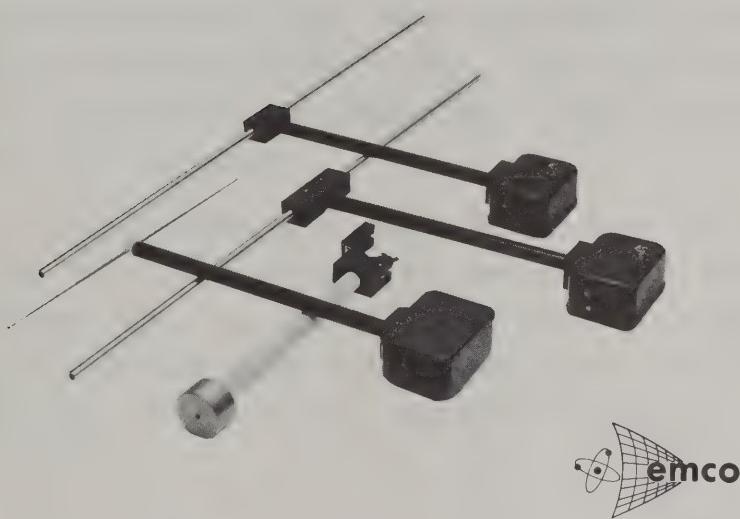
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## ADJUSTABLE ELEMENT DIPOLE ANTENNA MODEL 3120



Specifications subject to change without notice.

Calibration tables are furnished with each antenna.

### GENERAL DESCRIPTION

The EMCO Model 3120 Adjustable Dipole Antenna set is designed to operate over the frequency range of 28 MHz - 1 GHz for measurements meeting Military Standard and FCC Radiated Emissions Compliance testing using a 50 ohm input impedance field intensity meter.

The antenna system comprises three baluns: B-1 28-140 MHz, B-2 140-400 MHz, B-3 400-1000 MHz.

Baluns B-2 and B-3 cover their full frequency range, each with one set of adjustable length elements. Balun B-1 is supplied with one set of adjustable length elements which cover the frequency range of 50 - 140 MHz. A set of rigid extenders inserted between the balun and the adjustable rods allow the antenna to be adjusted from 28 - 50 MHz.

Each balun is supplied with dipole factors to convert the received signal to electric field intensity over the specified frequency range of that particular balun. A metric scale tape is also supplied to provide proper adjustment of the element length for each frequency in test.

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## LOG PERIODIC ANTENNAS

### EMCO SERIES 3140

The EMCO Model 3145 and 3146 log-periodic antennas are products designed with an emphasis on size considerations. This provides for ease in portability and for use in applications where lack of space is a problem, such as in anechoic chambers. These antennas are fully calibrated to include gain and antenna factors making them ideal for compliance testing for FCC Part 15. When used for susceptibility testing, they can handle up to 1000 watts of input power, creating fields of over 200 volts per meter.

All antennas have a gain greater than 5 dB and are linearly polarized. They also have the relatively constant input impedance characteristic of log-periodics. The 3145 has a frequency range of 100 - 1100 MHz with a maximum width of 1.5 meters (59"). The model 3146 covers the frequency range of 200 - 1000 MHz and has a maximum width of 75 cm (29½").

Model 3145 -- 100 - 1100 MHz

Selling price \$1,100.00

Delivery: Stock to 45 days

Model 3146 -- 200 - 1000 MHz

Selling price \$1,000.00

Delivery: Stock to 45 days



## ELECTRIC FIELD ANTENNA MODEL 3301



### GENERAL DESCRIPTION

The EMCO Model 3301 Electric Field Antenna is an active rod antenna with a broadband low noise amplifier operating over the frequency range from 14 KHz - 30 MHz. With its self-contained battery supply, the Model 3301 can drive any receiver with 50 ohm input impedance.

The Model 3301 Electric Field Antenna provides a minimum effective sensitivity increase of 15 dB over the passive 41 inch rod with band switching matching network.

### SPECIFICATIONS

Frequency Range	14 KHz - 30 MHz
Antenna Factor	Nearly constant before 10-13 dB throughout range
Dynamic Range	Approximately 66 dB broadband
Output Impedance	50 ohms
Input Impedance	>1 megohm (at antenna block)
Amplifier Voltage Gain	7 dB flat $\pm$ 2 dB across bandpass
Harmonic Distortion	-40 dB from fundamental
Antenna	41 inch telescoping rod
Connector	Type BNC
Power Supply	1 each 12.6 V Mercury cell replaceable for 20 hour operation.
Dimensions (Amplifier Unit)	
Length	5-1/8"
Width	4-1/4"
Height	3"
Weight	1-3/4 lb. (with 41" rod)

Specifications subject to change without notice.

Calibration tables are furnished with each antenna.

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# LINE IMPEDANCE STABILIZATION NETWORKS SERIES 3700

## GENERAL DESCRIPTION



## SPECIFICATIONS

Isolation Frequency Range	450 KHZ to 30 MHz
Power Source Frequencies	DC to 400 Hz
Size and Weight	Dependent on number of lines to be tested and current handling capacity of each line.

Meets FCC specifications as set forth in Docket 80-284

EMCO's LISNs are specifically designed to be used in conducted emissions testing for incidental radiation devices such as computers, RF power supplies, electrical games, calculators and tape recorders. These Line Impedance Stabilization Networks comply with requirements and test procedures for computer devices as specified in FCC Dockets 20-780 and 80-284.

Previous standards suggested the use of a LISN based on a 5 microhenry power inductor. FCC Docket 80-284 introduced the use of the LISN based on a 50 microhenry inductor which has a characteristic impedance of about 50 ohms from 450 KHz to 30 MHz.

The EMCO LISNs are available for testing of equipment requiring either single or multiphase connections. Because the electric current capacity needed for testing one item may differ from another, the EMCO LISNs are offered in 5 and 20 ampere capacities as standard units. If larger current capacities are required, they can be built on a special item basis.

## APPLICATIONS

Although the Series 3700 can be used in open field test sites, these LISNs are particularly

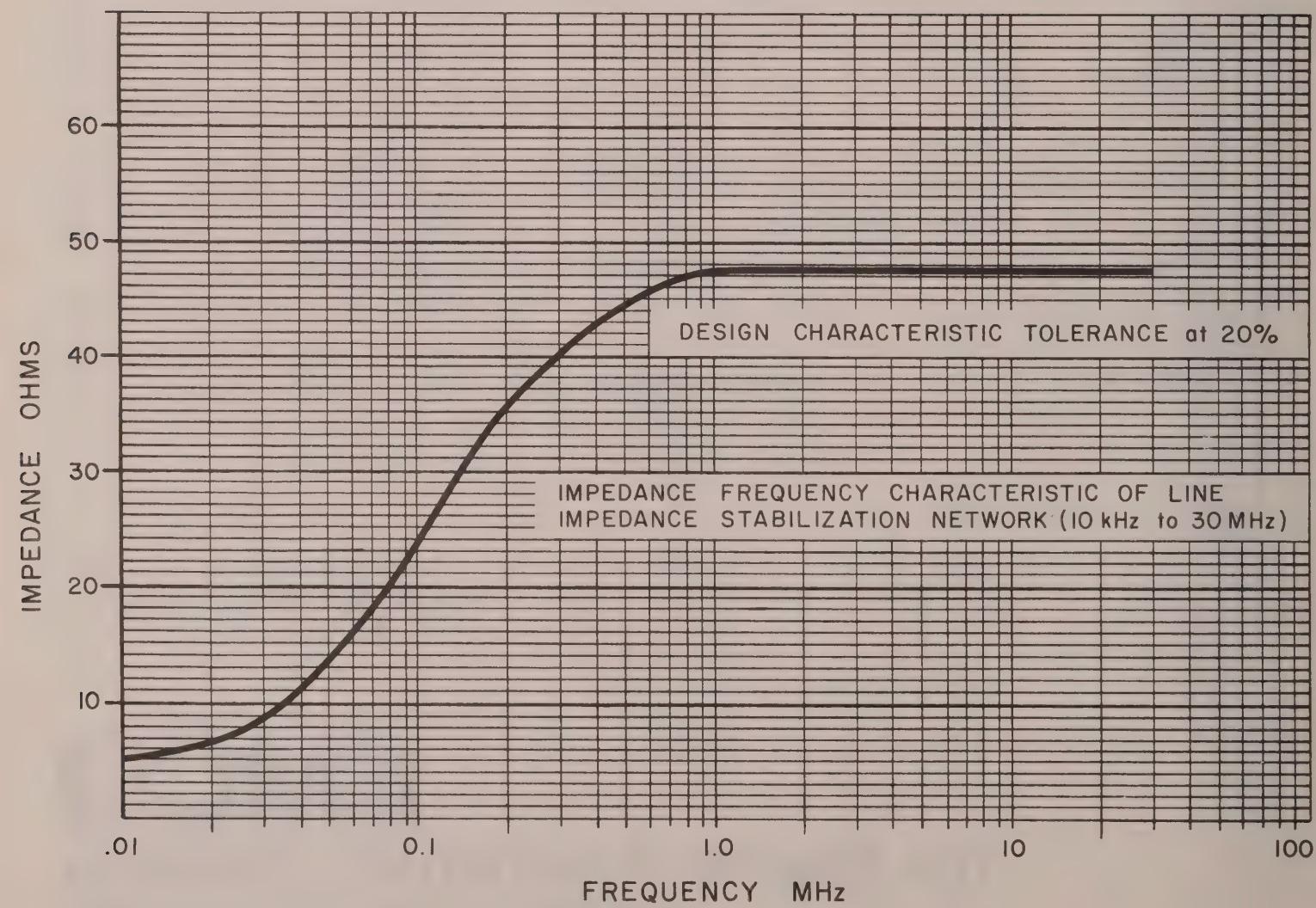
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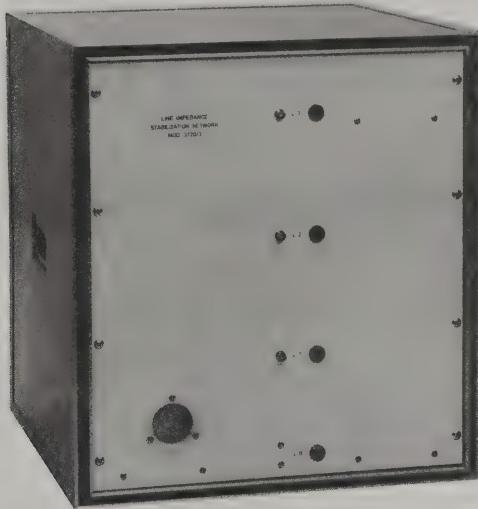
suited for use in shielded or anechoic chambers. This becomes an important application as more manufacturers, because of space limitations, employ the use of enclosed test chambers which comply with test site specifications listed in NPRM 80-284.

EMCO's Series 3700 are completely compatible with other devices which might be required for the measurements of line-conducted emissions. They are also compatible with EMCO's full line of antennas, magnetics test instruments, rejection networks and accessories which apply to all areas of EMI/RFI testing.



# LINE IMPEDANCE STABILIZATION NETWORKS SERIES 3800

## GENERAL DESCRIPTION



## SPECIFICATIONS

Isolation Frequency Range      10 KHz to 30 MHz

Power Source Frequencies      DC to 400 Hz

Size and Weight      Dependent on number of lines to be tested and current handling capacity of each line.

Meets current American (FCC) and European (CISPR and VDE) specifications.

The EMCO Series 3800 Line Impedance Stabilization Networks (LISN) are designed to meet FCC and European (CISPR and VDE) standards for conducted emissions measurements.

The EMCO 3800 inserts a relatively constant impedance to high frequency signals which may be present on the power lines, between the device under test and the power source. At the same time the LISN should have a near zero impedance to the power supply frequency.

Previous standards suggested the use of a LISN based on a 5 microhenry power inductor. FCC Docket 80-284 introduced the use of the LISN based on a 50 microhenry inductor which has a characteristic impedance of 50 ohms from 450 to 30 MHz. The current European standards require the use of a dual inductor (50 and 250 microhenrys) for use in testing between 10 KHz and 30 MHz.

The EMCO Series 3800 LISNs will be offered on a "per line" basis. Generally, tests are performed on each phase and/or neutral line of a power supply system. For a three phase power system with a neutral, this would require a 4 wire service and possibly a 4 channel LISN.

All LISNs for a particular testing standard will have the

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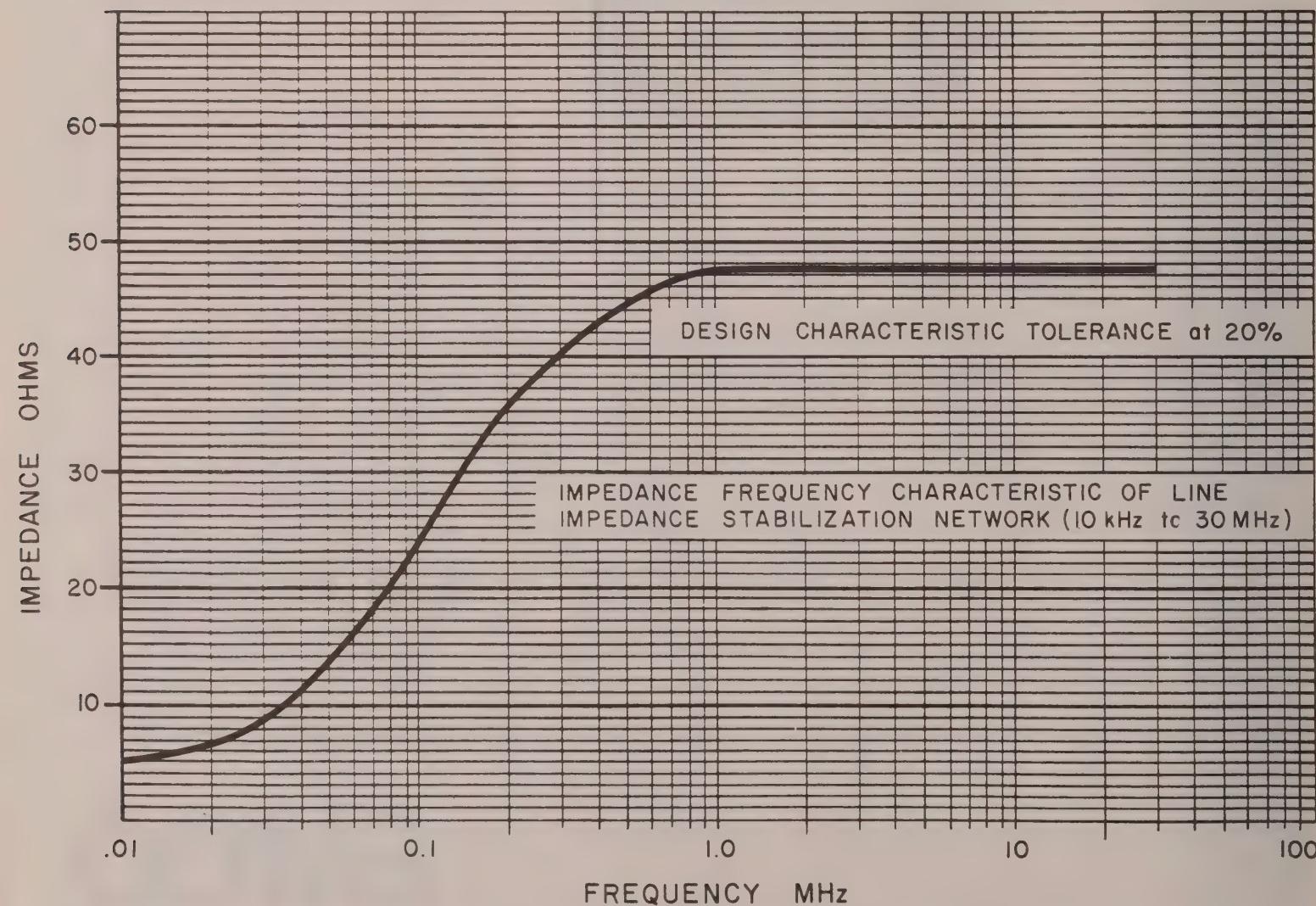
same characteristic impedance; however, the electric current capacity needed for testing one item may greatly differ from another. For this reason, the EMCO LISN series are offered in 5 and 20 ampere capacities as standard units. If larger current capacities are required, they can be built on a special item basis.

#### APPLICATIONS

Although the Series 3800 can be used in open field test sites, these LISNs are particularly suited for use in shielded or an-

echo chambers. This becomes an important application as more manufacturers, because of space limitations, employ the use of enclosed test chambers which comply with test site specifications listed in NPRM 80-284.

EMCO's Series 3800 are completely compatible with other devices which might be required for the measurements of line-conducted emissions. They are also compatible with EMCO's full line of antennas, magnetics test instruments, rejection networks and accessories which apply to all areas of EMI/RFI testing.



LINE IMPEDANCE STABILIZATION NETWORKS  
EMCO SERIES 3700/3800

The EMCO Series 3700/3800 Line Impedance Stabilization Networks (LISN) are designed to meet FCC and European (CISPER and VDE) standards for conducted emissions measurements.

Electromagnetic signals generated in electrically operated devices may be capable of creating undesirable signals in the high frequency bands. These signals may emanate directly by radiation from the device or by conduction through the power supply lines attached to the device.

The level of these conducted signals must be accurately measured to determine if they are within the specification limits as set forth by a particular standard.

In reality, all power supplies differ in source impedance although they are generally very much less than 1 ohm. The LISN is designed to insert a relatively constant impedance to high frequency signals which may be present on the power lines, between the device under test and the power source. At the same time the LISN should have a near zero impedance to the power supply frequency.

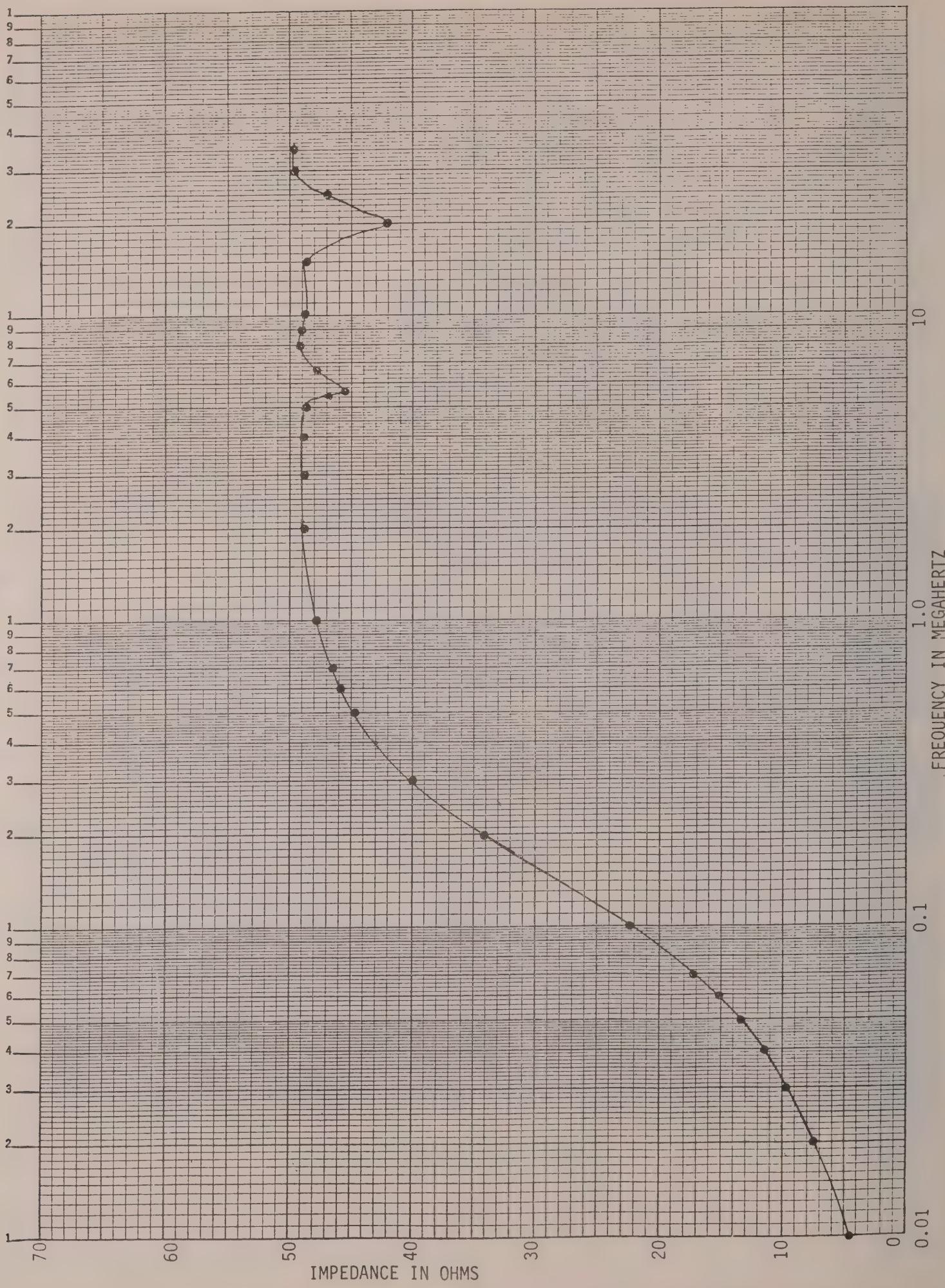
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The EMCO Series 3700/3800 LISNs will be offered on a "per line" basis. Generally, tests are performed on each phase and/or neutral line of a power supply system. For a three phase power system with a neutral, this would require a 4 wire service and possibly a 4 channel LISN.

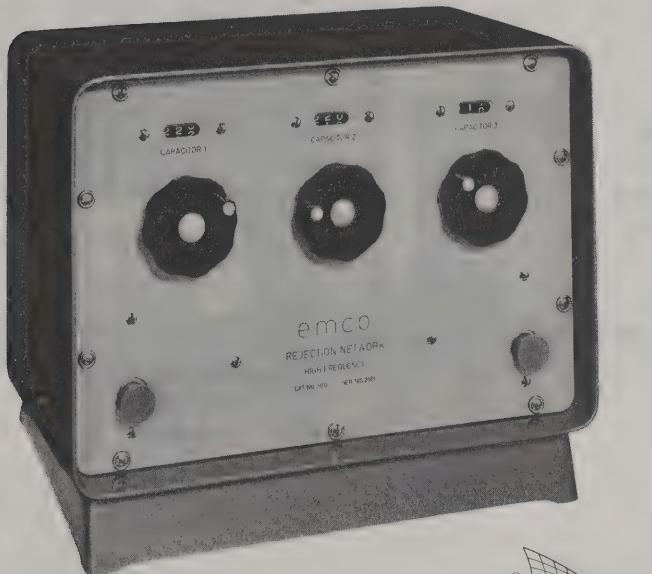
All LISNs for a particular testing standard will have the same characteristic impedance; however, the electric current capacity needed for testing one item may greatly differ from another. For this reason, the EMCO LISN series are offered in 5 and 20 Ampere capacities as standard units. If larger current capacities are required, they can be built on a special item basis.

Model 3705 - 5 Amp Capacity (450 KHz - 30 MHz)	\$285.00 per phase
Model 3720 - 20 Amp Capacity (450 KHz - 30 MHz)	325.00 per phase
Model 3805 - 5 Amp Capacity (10 KHz - 30 MHz)	550.00 per phase
Model 3820 - 20 Amp Capacity (10 KHz - 30 MHz)	600.00 per phase

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KEUFFEL & ESSER CO.  
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## REJECTION NETWORKS MODELS 3011-3013 & 3021-3023



### SPECIFICATIONS

Model	Frequency Range	Number of Bands	Maximum Voltage Input
3011/21	10 KHz—100 MHz	8	315
3012/22	100 MHz—400 MHz	3	225
3013/23	400 MHz—1000 MHz	1	225

Each of the units is mounted in a custom enclosure measuring 13 $\frac{1}{4}$ " x 9 $\frac{1}{4}$ " x 8". The units are also available in standard rack mounts measuring 19" x 10 $\frac{1}{2}$ " x 8".

Specifications subject to change without notice.

### GENERAL DESCRIPTION

EMCO Rejection Networks, designed specifically for radio frequency interference testing according to various military specifications, are passive, continuously tunable notch filters providing as much as 100 dB of attenuation over the frequency range 10 KHz - 1 GHz. Made of light, rugged components, they require no warm up time and no external power source. Properly tuned they may be connected directly to transmitters having as much as 2 Kw output. They are the only instruments presently available combining the features of high attenuation, high power capabilities, and continuous tuning.

### APPLICATIONS

Masking of the desired signal by the fundamental frequency is a frequently encountered problem in RFI measurements. Transmitter measurements such as the spurious emission and intermodulation tests called for in Tri-Service Specification, "Measurement of Radio Frequency Spectrum Characteristics," (MIL-STD-449B) specifically point out this problem. The fundamental frequency is particularly troublesome in the spurious emission test where the entire spectrum must be scanned to determine the frequency and amplitude of transmitter spurious emissions.

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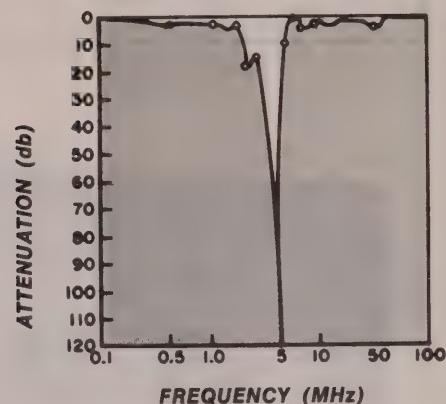
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The high-power fundamental frequency often causes mixing in the test receiver circuitry giving rise to so-called receiver spurious responses. The procedure to determine whether a response indicated on the test receiver is a true one, i.e., a transmitter spurious emission, is very tedious and time consuming. The EMCO Rejection Network may be used to particular advantage in measurements of this type. With this instrument placed in the line between the receiving antenna and the test receiver, the fundamental frequency may be blocked, thereby eliminating the possibility of the fundamental causing receiver spurious responses. Consequently there is a considerable saving of check-out-time.

The EMCO Rejection Network is also of value in conjunction with a spectrum analyzer when the frequency spectrum of a high power signal source is under examination. The increased sensitivity of modern spectrum analyzers, while a major step forward in instrument capability, also renders these instruments more susceptible to spurious responses.

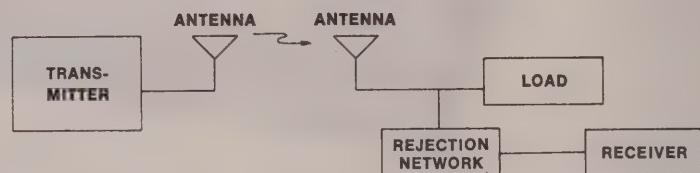
In communications, data, and telemetry applications where transmission is continuous, the accepted methods of pulse blanking or interference is not possible. Here, too, the EMCO Rejection Network has proven valuable. The instruments are presently being used successfully in Navy Range Ships as protection devices preventing receiver burn-out, block-out, and signal degradation.

## TYPICAL REJECTION CURVE

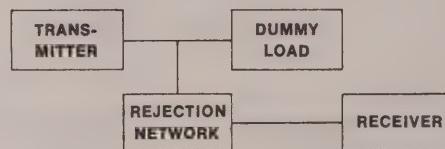


## SUGGESTED TEST ARRANGEMENTS

### RADIATED MEASUREMENTS

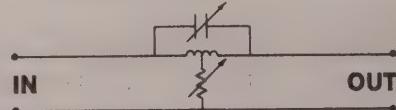


### CONDUCTED MEASUREMENTS



### Low and Medium Frequency Units

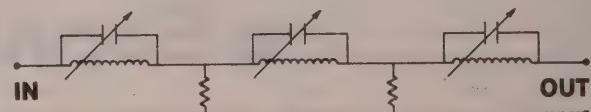
Both the Low and Medium Frequency Units consist of a bridged-T circuit similar to that shown below.



The circuits utilize center tap inductors to achieve the frequency band of interest. The low frequency range is covered in 8 bands and the medium frequency range in 3 bands. The parallel tank circuit is tuned to the desired rejection frequency and the potentiometer is then adjusted to balance the current flow, thus increasing the rejection.

### High Frequency Unit

The High Frequency Unit covers the frequency range 400-1000 MHz in one band. It is a high Q, frequency-selective, voltage-divider circuit using three "butterfly" networks in series. A typical circuit is shown below.



Each network is tuned so that maximum rejection at the desired frequency is achieved.



## CAVITY REJECTION NETWORK MODELS 3051-3054

### GENERAL DESCRIPTION



### SPECIFICATIONS

Rejection Insertion Loss	80 dB minimum at tuned frequency 5 dB average or less
Bandwidth	0.2% of tuned frequency at 20 dB point; 0.4% of tuned frequency at 10 dB point
Impedance Connectors	Designed for 50 ohm system Type N
MODEL 3051	(15") 1.0 GHz to 2.2 GHz
MODEL 3052	(8") 2.2 GHz to 3.1 GHz
MODEL 3053	(6") 3.0 GHz to 6.5 GHz
MODEL 3054	(3") 6.5 GHz to 10.0 GHz

The EMCO Cavity Rejection Networks are continuously tuneable rejection filters operating in the frequency range of 1.0 GHz - 10 GHz. The Cavity Rejection Networks are designed specifically for specification compliance testing such as is outlined in FED-STD-462 and MIL-STD-826A.

The EMCO Cavity Rejection Networks are constructed completely of brass and aluminum material. The main body of the cavities are cylindrical with a moveable tuning plate. Matching stubs for optimizing the cavity loading at any particular frequency are also provided.

The networks exhibit extremely sharp resonances and thus perform as excellent rejection filters having low insertion loss and skirt attenuation.

### APPLICATIONS

The EMCO Cavity Rejection Networks are particularly suited for EMI Specification compliance testing such as is described in MIL-STD-826A and FED-STD-462. The continuous tuning and high power acceptance of the EMCO networks offer much greater capability than the fixed or limited tuning range cavity filters normally used for EMI testing.

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## HELMHOLTZ COIL SYSTEMS SERIES 6400



Specifications subject to change without notice.

### GENERAL DESCRIPTION

EMCO Helmholtz Coil Systems are designed specifically for applications where a homogeneous field of varying strengths is required. The size and available field strength are customer specified items. Strengths as high as .5 gauss per ampere have been achieved at frequencies up to 50 KHz with homogeneous fields as large as 2/cubic feet.

Available in sizes from 12" to over 6' in diameter.

### PRINCIPLE OF OPERATION

A Helmholtz Coil Systems consist of two identical coils one radius apart. The use of two coils in this configuration produces a homogeneous magnetic field over a larger volume of space than does a single coil. The magnetic field strength at the center of the Helmholtz Coil, produced by known current through coils, is given by;

$$H = \frac{8.99 NI}{10 R}$$

where  $H$  = the magnetic field in oersteds,

$I$  = the coil current in amperes, and

$N$  = the number of turns per coil,

$R$  = the coil radius in centimeters for  $H$  in Teslas.

Since

1 Tesla =  $10^4$  oersteds,

$$\text{then } H = \frac{8.99 \times 10^{-5} NI}{R} \text{ Teslas}$$

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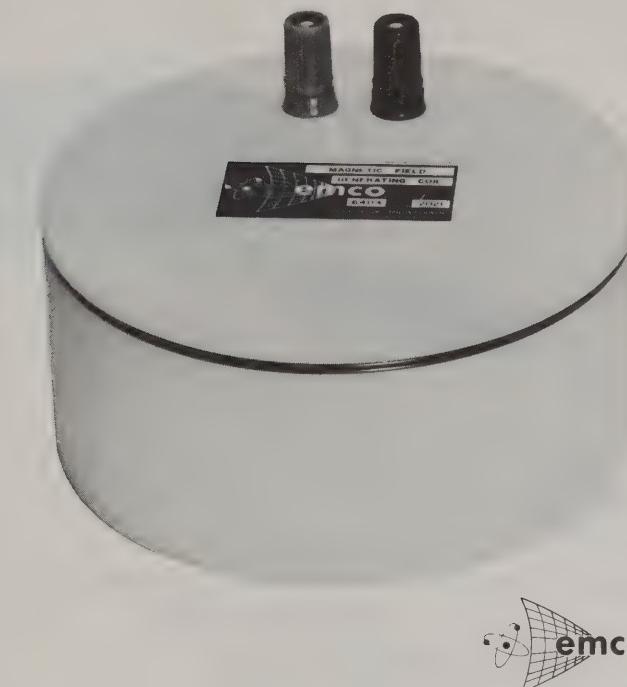
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# MAGNETIC FIELD GENERATING COIL (RS01) MODEL 6404



## GENERAL DESCRIPTION

The EMCO Model 6406 Magnetic Field Generating Coil is a device to facilitate magnetic susceptibility tests on equipment in accordance with MIL-STD-461A, Test Method RS01. The 12 cm diameter coil should be positioned 5 cm from the test article. The magnetic field emission loop conversion is stated in teslas per ampere by the formula  $B = 5 \times 10^{-5}$  tesla/ampere at 5 cm from the coil wires.



## SPECIFICATIONS

### ELECTRICAL CHARACTERISTICS

$B = 5 \times 10^{-5}$ tesla/ampere at 5 cm from the coil wires	
Self Resonant Frequency	Greater than 100 KHz
Coil	10 turns 16 gauge copper wound on delrin form
Connector	Banana jacks 0.75 inch spacing
Useful Frequency Range	30 Hz to 30 KHz
Maximum Current	5 amps continuous; 10 amps intermittent

### MECHANICAL CHARACTERISTICS

Nominal Coil Diameter	12 cm
Coil Thickness	0.3 cm
Weight	1 lb

Specifications subject to change without notice.

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## MAGNETIC FIELD INTENSITY METER MODEL 6640



### SPECIFICATIONS

Bandwidth	1 Hz to 50 KHZ or 10 Hz to 50 KHz, selectable from front panel.
Sensitivity	Narrowband: 10 picoteslas Broadband: 300 picoteslas
Dynamic Range	80 dB
Selectable Filters	60 and 180 Hz rejection filters selectable IN or OUT from front panel. 40 dB rejection at each frequency. 400 and 1200 Hz rejection filters (in addition to the above) optional
Power Requirements	Battery powered with internal charger. Charger requires less than 3 watts of 115v, 60 Hz AC power Model 3201 std w/unit
Sensor Size	17" x 5 3/4" x 15" rack-mountable 16" x 5 3/16" x 5" front panel cover
Weight	27 lb with cover

### GENERAL DESCRIPTION

The EMCO Model 6640 Magnetic Field Intensity Meter is a broadband low frequency receiver whose response is directly proportional to the amplitude of the magnetic field variations present at the directional sensor. The response is constant within  $\pm 3$  dB over the frequency range of 1 Hz to 50 KHz.

The narrowband sensitivity of the Model 6640 is approximately 10 picoteslas at 1 KHz, and better than 300 picoteslas broadband. The readout of the model 6640 consists of a dB meter presentation and a low impedance analog voltage output. The response bandwidth of the instrument can be selected as 1 Hz to 50 KHz or 10 Hz to 50 KHz from the front panel. Also, 60 Hz and 180 Hz rejection switched IN or OUT from the front panel.

### APPLICATIONS

In general, for Electronic Designers, the 6640 allows testing of the interaction between elements on small scale electronic assemblies which can create unique magnetic interference problems.

The Model 6640 Magnetic Field Intensity Meter is particularly suited for EMI Specification compliance testing such as

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## PROBES AVAILABLE FOR THE 6640

3201- Standard Probe  
Standard probe achieves sensitivity to 10 picoteslas  
narrowband (.01 Gamma)

Size is 1 1/16" x 1 1/4" x 8 1/2".

3202- High Intensity Magnetic Field Probe  
Sensitivity to 10 picoteslas

narrowband (.01 Gamma)

3302- Electric Field Probe  
Similar to 3201 except measures fields up to 100 K Gammas, size 1 1/16" x 1 1/4" x 8 1/2".

Allows the 6640 to operate as an electrical field measuring device with a sensitivity of less than 2.6 millivolt meter. Unit consists of 1 meter rod antenna with preamplifier base. Frequency range 100 Hz to 50 KHz.

### 3401- Current Probe

The current probe allows the 6640 to be used as a Low Level current measuring instrument operating in the frequency of 1 Hz to 50 KHz.

### 3501- Sniffer Probe

The sniffer probe is a small size probe for use in pinpointing localized sources of magnetic interference inside a system or subsystem. Available in diameter on 5" rod.

MIL-STD-462. Its response, sensitivity and directivity characteristics offer unique capabilities not found in other types of EMI testing instruments. Since the Model 6640 is a complete battery powered instrument, it is well suited for the extremely well suited to testing of the Model 6640 also make it possible to use the 6640 a brief description of various probes are available with 6640, a brief description of each is available. 222. The bandwidth and sensitivity of the Model 6640 is well suited to testing of the type outlined in FED-STD-222. The site surveys and general laboratory use. The Model 6640 is a valuable evaluation of the magnetic shielded surveying effectiveness of enclosures, including effectiveness of the magnetic shielded probe site surveys and general laboratory use.

## DC MAGNETOMETER MODEL 6701



### SPECIFICATIONS

Bandwidth	DC to 20 Hz
Sensitivity	3.0 gamma (0.03 milli-gauss) peak-to-peak
Dynamic Range	0 to + 90,000 gammas (+ 0.90 gauss)
Drift	10 gammas maximum long term (8 hours)
Analog Output	+ 2.5 volts full-scale deflection, where full-scale corresponds to field intensity values of + 75 gammas to + 75,000 gammas, selected with a front panel gain control. The output impedance is 1 K ohms.
Sensor Temperature Range	-50°C to +100°C. Accurate to within + 1 gamma between -40°C and +65°C
Batteries	May be operated for periods up to 8 hours on self-contained rechargeable batteries.
Size	Chassis: 9" x 7" x 6" (6 ft cable supplied; longer on request), Sensor: 9/16" x 1 3/4" x 2 3/4" (measurement volume, 0.2 cubic inch).
Weight	7 lb approx.

### GENERAL DESCRIPTION

The EMCO 6701 Magnetometer is a lightweight, battery powered instrument for field or laboratory use. Its sensor is a uniquely wound and driven saturable ring core whose differential height output pulses provide the magnetic field strength information to the detection circuits. The primary output for recording or monitoring is a direct analog voltage available at a BNC connector on the front panel. Zero dB to 60 dB of output gain is provided in 10 dB steps for setting the desired output sensitivity. A zero center DC microammeter is coupled to the output for observing near-steady-state field changes as small as 5 gammas.

The balance potentiometer may be adjusted to null out steady-state field up to 50,000 gammas. The strength of the field nulled can be read to within 5 gammas on the 10-turn dial.

### APPLICATIONS

The Model 6701 DC Magnetometer is both versatile and convenient because of its high performance, small size, and portability. A few of the many possible applications for the Model 6701 are:

Detection of geomagnetic activity

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Magnetic surveys

Quantitative measurement of  
magnetic moment or field inten-  
sity

Measurement of shielding  
effectiveness of magnetically  
shielded enclosures

Traffic counting and control

Weapons detection for anti-  
hijacker surveillance and securi-  
ty check

Aspect sensor

## TRIAXIAL MAGNETOMETER SYSTEM MODEL 6713



### GENERAL DESCRIPTION

The 6713 Triaxial magnetometer systems are designed to operate as a reasonably high density instrument which may be mounted in larger bore hole instruments for use as an in-line guidance tool for controlled drilling systems.

The unit consists of three rigidly mounted orthogonal axes magnetometers which give readouts proportional to the applied magnetic fields to the three orthogonal axes. The ring core sensors, similar to the flux gate sensors, have a cosine response of sensitivity with a virtual null of output occurring when the sensitive axis is at right angles to the applied magnetic field.

The circuitry consists of an oscillator, coil drivers, detectors, and output amplifiers for each sensor channel. A voltage regulator built into the instrument provides the regulated power for all three of the magnetometer sensors.

The units are powered by  $\pm 13$  to 18 VDC from an external power source (not furnished). Each instrument is furnished with a non-magnetic instrument case (not pressure proof), and a 7-terminal input-output connector which allows interfacing with the customer's pressure bulkhead connector.

OPERATING CHARACTERISTICS/SPECIFICATIONS	
Input power requirements	$\pm 13\text{-}18$ VDC
Total current drain for three axes	60 ma
Voltage ripple	5%
Output characteristics into 100K ohm load	Three independent analog outputs operated by one common input power supply
Full scale output	$\pm 5$ VDC
Magnetic field input range	0 to $\pm 0.7$ gauss (Earth's magnetic field intensity)
Mechanical Alignment	Alignment of the three quadrature axes of the sensors are limited to 0.5 degrees of maximum error
Physical dimensions	
Maximum diameter	1.75 inches (4.45 cm)
Maximum length	14 inches (35.56 cm)
Weight:	2 lbs 4 ozs (965 gm)
Environment	
Maximum operating temperature up to $360^{\circ}\text{F}$ ( $175^{\circ}\text{C}$ ) (depending on model)	

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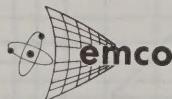
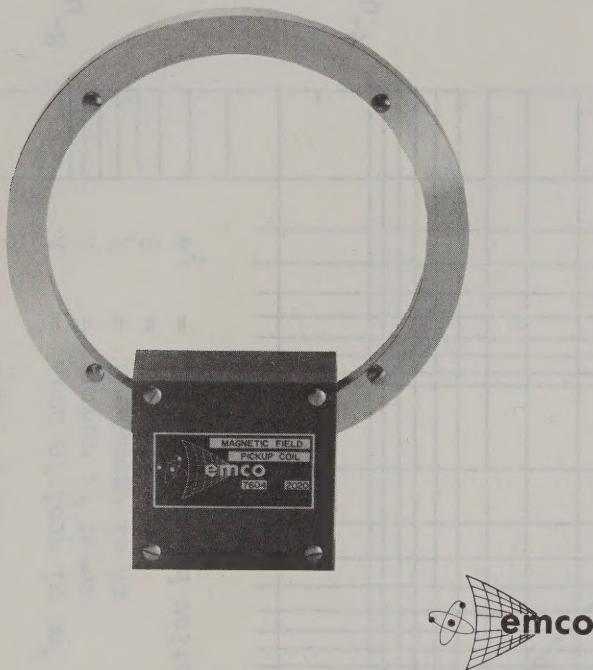
Post Office Box 1546 / Austin, Texas 78767  
Telephone 512 / 451-8273



# MAGNETIC FIELD PICKUP COIL (RE01) MODEL 7604

## GENERAL DESCRIPTION

The EMCO Model 7604 Magnetic Field Pickup Coil is a device for measuring magnetic emissions in accordance with MIL-STD-461A, Method RE01. It is normally used connected to a suitable EMI meter for the range of 30 Hz - 30 KHz.



## SPECIFICATIONS

### ELECTRICAL CHARACTERISTICS

Useful Frequency Range	30 Hz - 30 KHz
Sensitivity	See graph

### MECHANICAL CHARACTERISTICS

Diameter	13.3 cm
Coil	36 turns of 7/41 litz wire, electrostatically shielded
Connector	BNC receptacle
Weight	2 lb

Specifications subject to change without notice.

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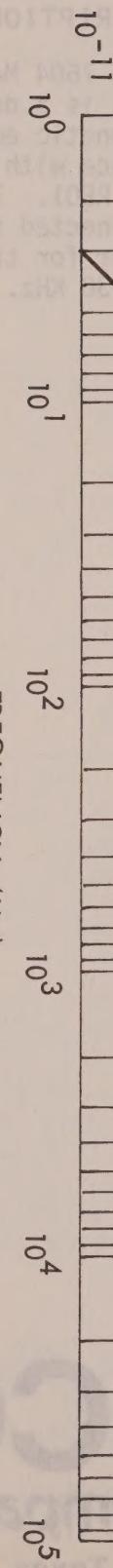
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$10^{-7}$

VOLTS (RMS)

$$\frac{e_i}{B} = 2\pi N A f \times 10^{-16}$$

$A$  = Area of Loop in  $\text{cm}^2$   
 $N$  = Number of turns  
 $f$  = Frequency in Hz  
 $B$  = 1 Picotesla  
 $e_i$  = Series induced voltage



VOLTS (RMS) UNLOADED VERSUS FREQUENCY  
FOR A CONSTANT FIELD OF 1 PICOTESLA

Magnetic Field Emission Loop Conversion Factor  
(See MIL-STD-461A)



**For further information about EMCO equipment contact:**

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